

Revisions to the Remedial Design Workplan Text 12th Street Landfill, Otsego Township, Michigan

- Subsection 4.5 – 100-Year Flood Elevation of the River (pages 20 and 21)
- Section 5 – Predesign Studies (pages 22 through 26)



MW-6 and MW-7 in the woodland area. Figure 8 illustrates the approximate areal extent of visible paper residuals outside of the landfill based on data collected during the RI and the U.S. EPA's predesign investigation. The U.S. EPA's predesign investigation also provided information on the concentrations of PCBs in 159 samples of near surface soil and residuals (*i.e.*, from 0 to 24 inches). The U.S. EPA's sample coverage in the wetland was laid out on a radial grid. The U.S. EPA's report did not conclude that elevated concentrations of PCBs were present at location in the wetland where residuals were not visually observed, nor did it suggest a change in the use of the visual criterion that was established in the ROD for identifying areas in which residuals would be excavated and consolidated into the 12th Street Landfill.

The approximate thickness of paper residuals in the wetland can be estimated based on other available information, including the boring logs for the monitoring wells that were installed during the RI, and topography. The remaining uncertainty regarding the precise thickness of residuals in the wetland will not significantly affect either the remedial design or the remedial action. Consequently, no additional information is needed to delineate the areal extent of paper residuals outside the footprint of the landfill in the wetland. However, since Weyerhaeuser did not conduct any of the previous site investigations, information regarding the constructability issues associated with a high water table in the wetland and the degree of difficulty in distinguishing the visible paper residuals from the native soil will be useful for Weyerhaeuser during the remedial design activities.

In contrast, the uncertainty regarding the thickness of residuals in the woodland area and on the asphalt plant property is more significant, considering the large amounts of material that are likely to need to be cut in these areas to achieve final grades, and to facilitate discussions with the owners of these properties.

4.5 100-Year Flood Elevation of the River

Previous documentation provides somewhat inconsistent information regarding the 100-year flood elevation in the vicinity of the landfill. The ROD states that the 100-year flood elevation at the site is 705 feet above M.S.L. However, Figure 2.3 in the Feasibility Study (G&M, 1997) for the site indicates that the 100-year flood elevation is 702.55 feet above M.S.L., which is consistent with a memorandum prepared by BBL that indicated that the 100-year flood elevation at the site is 702.5 feet above M.S.L. (BBL, 1998). Weyerhaeuser requested information about the flood elevation at the site from the Federal Emergency Management Agency (FEMA), the United States Geological Survey (USGS), the United States Army Corps of Engineers (USACE), and the National Weather Service, but no data were available from these agencies.

A 100-year flood elevation of 705.0 feet above M.S.L. was approved by the U.S. EPA as the design basis for the erosion control measures that were implemented as part of the Emergency Action in 2007 (U.S. EPA, 2007c). Use of the 705.0 foot elevation for the 100-year flood event was a conservative approach based on the existing information. Weyerhaeuser plans to use this elevation as the design basis for the remaining erosion control measures to be implemented as part of the Remedial Action, unless new

information is obtained. While this elevation may be appropriate for the design of erosion protection features, a more detailed analysis would be needed to determine an appropriate elevation for habitat characterization. Weyerhaeuser, at this time, does not plan to, and is not required to, conduct any habitat characterization as part of the predesign studies.

Section 5

Predesign Studies

Predesign studies are proposed to assist in the development of the remedial design for OU-4. The proposed predesign studies, along with the objectives and scope of the studies, are summarized in the subsections that follow. Additional details regarding the methods, procedures, equipment, and materials are contained in the Multi-Area Quality Assurance Project Plan (QAPP) (Appendix A) and the Multi-Area Field Sampling Plan (FSP) (Appendix B).

Decontamination of equipment utilized during the predesign studies will be performed at a designated location decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill (this is appropriate in light of the limited amount of equipment decontamination involved in the predesign investigation). collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

5.1 Data for Grading Design

Additional data are needed to better estimate the thickness of paper residuals along the property boundaries with 12th Street, the asphalt plant to the southwest, and with the State property to the southeast, in order to reduce uncertainties in designing the final cover grades and to support discussions with the owners of these adjacent properties concerning access for purposes of implementing the remedial action. The scope of the investigative work necessary to obtain these data is as follows:

- Advance approximately 9 Geoprobe® borings into the 12th Street Landfill at select locations where fill material is believed to extend beyond the property landfill boundary to the southwest and to the southeast (Geoprobe® borings RDB-01 through RDB-09 on Figure 9). The borings will be advanced approximately 5 feet into the native soil underlying the fill, or to refusal.
- Advance a minimum of two soil borings (RDB-10 and RDB-11) near the southern end of the landfill, as shown on Figure 9, to confirm the thickness of the fill in this area. Advance the borings approximately 5 feet into the native soil underlying the fill or to refusal. The locations of these borings may be adjusted in the field as necessary to avoid underground or aboveground utility lines. Additional borings may be installed to the north of the initial borings as may be deemed useful by Weyerhaeuser, in consultation with oversight agencies as needed, for purposes of designing the landfill cover (e.g., if fill material is not encountered at a location where existing data indicates fill is present).
- Prepare a Soil Boring Log (refer to the FSP in Appendix B for a sample log) for each borehole based on visible observation. Classify the materials encountered based on the procedures outlined in ASTM D-2488. The logs will document the borehole identification number, the drilling dates and times, the names of field personnel, soil descriptions, sample depths, and recovery. Retain a representative sample of each type of material encountered (no laboratory analyses are planned). As may be appropriate, photographs of the materials encountered or other pertinent observations will be documented. Photographs will be labeled to indicate the subject, location, date, name of photographer, and project identification number.

- The on-site geologist/engineer will prepare the Soil Boring Logs in the field. The logs will be reviewed by the senior engineer in the office. A field notebook will also be maintained by the on-site scientist to document other pertinent field information. The senior engineer will review the field notebook for clarity and completeness in meeting the investigation objectives.
- Abandon the boreholes by filling them with bentonite grout following completion of the borehole logs.
- Dispose of the Geoprobe® samples on-site in an area that will be covered by the final cover and in a manner that will not result in erosion before the final cover is installed.
- Decontaminate the Geoprobe® equipment following completion of the work. Decontamination will be performed at a designated location decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of Geoprobe® equipment between borings is not necessary because new acrylic tubes will be used at each location to collect material for visual observation (samples are not being collected for laboratory analysis).
- Decontamination water will be collected and discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).
- Survey the locations and ground surface elevations of the boreholes following completion. The accuracy of the survey will be ± 0.01 foot for the horizontal coordinates and ± 0.1 foot for the vertical elevations. The survey locations will be added to the boring logs.

5.2 Landfill Gas Evaluation

Based on experience with other landfills containing similar materials, a passive gas venting system is likely to be necessary to prevent potential off-site gas migration from the landfill and to protect the integrity of the landfill cover. The detailed design of the passive gas venting system will be prepared during the design phase for the 12th Street Landfill and may include features that support the potential future development of an “eco-park.” The passive gas venting system will also be designed such that it could be retrofitted to an active gas system if deemed necessary during the operations, monitoring, and maintenance (OM&M) period for the landfill.

To assist in the design for the passive gas venting system, the following scope of work will be performed:

- Review information that may be provided by the MDEQ in connection with the management of subsurface landfill gas at the King Highway Landfill (Operable Unit #3) for potential applicability to the 12th Street Landfill.
- Measure the concentrations of methane, carbon dioxide, and oxygen in the existing groundwater monitoring wells at the 12th Street Landfill that are screened in the vadose zone (MW-6A, MW-7A, and MW-8A), and in the Geoprobe® boreholes used to estimate the depth of the paper residuals along the property boundaries (refer to Figure 9). Pressures that may have developed within the groundwater monitoring wells caused by excess landfill gas (if present) will also be measured.

A passive gas venting can be designed without the above information. If these data cannot be readily obtained, additional efforts will not be employed to collect the information.

5.3 Extent and Depth of Residuals Outside the Landfill Footprint

Wetland area to the north of the landfill - The approximate areal extent of visible paper residuals beyond the toe of the landfill within the wetland has been defined through previous investigations (G&M, 1994b and U.S. EPA, 2004). This delineation needs to be confirmed at limited locations as part of the predesign studies. In addition, constructibility issues associated with a high water table in the wetland and the degree of difficulty in distinguishing the visible paper residuals from the native soil also need to be evaluated. The scope of the investigative work recommended to provide this information is as follows:

- Approximately three test pits (RDTP-01 through RDTP-03) will be excavated at the approximate locations in the wetland as shown on Figure 10. The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to the FSP for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent of the visible residuals contiguous with the landfill within the wetland. If an additional test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.
- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a designated location decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

In the event that in-field conditions limit the use of test pit excavating equipment (*e.g.*, a backhoe), other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

Asphalt Plant/State properties - Delineation of the areal extent and depth of visible paper residuals on the asphalt plant property to the southwest and on the State property to the southeast is needed, in order to support discussions with the owners of these adjacent properties concerning access for future remedial

actions. The scope of the investigative work recommended to provide this information for the asphalt plant/State properties is as follows:

- Approximately three test pits (RDTP-08 through RDTP-10) will be excavated on the asphalt plant property, and approximately four test pits (RDTP-04 through RDTP-07) will be excavated on the State property, at the approximate locations shown on Figure 10.
- The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to the FSP for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent and depth of visible residuals on the asphalt facility and/or the State property in order to support discussions with the owners of these properties concerning access for future remedial actions. If an additional test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.
- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a ~~designated location~~ decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- ~~Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).~~

In the event that in-field conditions limit the use of test pit excavating equipment, other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

5.4 Leachate Collection System Evaluation

The potential need for either an interim or a long-term leachate collection system within the fill materials as part of the remedial design will be evaluated during the predesign studies for the 12th Street Landfill. The evaluation will consider the presence of perched liquid within the waste; the water content of the waste; the potential for and the effects of settlement following placement of the final cover; the amount of water expected to be generated after placement of the final cover; and the practicability of extracting water from the fill materials.

The existing data (*e.g.*, grain-size analysis, moisture content, and consolidation test results [BBL, 2001]), in conjunction with industry experience at landfills containing similar materials, are sufficient to evaluate the potential need for either an interim or a long-term leachate collection system within the fill materials. No additional field information is needed to support the desktop evaluations.

5.5 Quality Assurance Project Plan, Field Sampling Plan, and Health and Safety Plan

As part of the implementation of the Emergency Actions undertaken by Weyerhaeuser in 2007, the U.S. EPA and Weyerhaeuser agreed to develop a Multi-Area QAPP and a Multi-Area FSP for all work to be performed by Weyerhaeuser within the Kalamazoo River Superfund Site. Consequently, the Multi-Area QAPP and the Multi-Area FSP are applicable to all activities conducted by Weyerhaeuser at the 12th Street Landfill, including the predesign field investigations. These documents were initially submitted to the U.S. EPA in June 2007 to support the Emergency Action to remove visible paper residuals/sediment in the former powerhouse discharge channel that is located adjacent to the 12th Street Landfill and to provide erosion protection and a stable slope along the portion of the landfill adjacent to the river (RMT, 2007a, and 2007b, respectively). The Multi-Area QAPP and the Multi-Area FSP were amended in September 2007 to support the Emergency Action to remove visible paper residuals/sediment along the banks of the former Plainwell Mill (RMT, 2007d and 2007e, respectively).

The Multi-Area QAPP has been amended again (Appendix A) and presents the objectives, organization, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with implementing the predesign field investigations. This Multi-Area QAPP will be modified in the future as other sampling programs are defined (*e.g.*, the short-term and long-term monitoring programs required under the ROD).

The Multi-Area FSP has also been amended (Appendix B) and establishes Standard Operating Procedures (SOPs) for the proposed predesign field investigations. As additional plans are prepared, it is anticipated that they will be incorporated as additional addenda to this document, referencing a combination of the existing SOPs, amended SOPs, and/or additional SOPs.

A Health and Safety Plan (HSP) has been developed to protect field personnel and authorized site visitors during execution of the predesign field investigation (Appendix C). The HSP has been prepared in fulfillment of the requirements that are contained in the CD and the SOW.

**Revisions to the Multi-Area Field Sampling Plan – Revision 2
(Appendix B of the Remedial Design Workplan
for the 12th Street Landfill Operable Unit)**

- Subsection 2.4.1 – Sample Collection Procedures (pages 13 through 17)
- Section 6 – Management of Investigation-derived Waste (pages 32 and 33)

The RD Workplan for the 12th Street Landfill includes a number of predesign investigations, some of which involve field data collection and visual observations. Field data collection activities will include visual information obtained by the advancement of test pits, visual information obtained by the advancement of Geoprobe[®] borings, and gas concentration measurements (methane, carbon dioxide, and oxygen) in certain existing monitoring wells and in the Geoprobe[®] borings advanced as part of the predesign investigation. Pressure will also be recorded in certain existing monitoring wells.

The field investigations will involve (1) a refined estimate of the extent of visible paper residuals beyond the landfill footprint; (2) the collection of data to support the grading design for the landfill; and (3) the collection of data for use in the design of a landfill gas management system. SOPs for each type of sampling activity are provided in Attachment A. These SOPs describe or reference ancillary procedures for equipment cleaning, field measurements, and calibration and maintenance of field instruments, as appropriate.

2.4.1 Sample Collection Procedures

Data for Grading Design

Additional data is required to better estimate the thickness of paper residuals along the property boundaries with 12th Street, the asphalt plant to the southwest, and with the State property to the southeast, in order to reduce uncertainties in designing the final cover grades, and to support discussions with the owners of these adjacent properties concerning access. The scope of the investigative work necessary to obtain these data is as follows:

- Advance approximately nine Geoprobe[®] borings into the 12th Street Landfill at select locations where fill material is believed to extend beyond the property boundary to the southwest and to the southeast. The borings will be advanced to approximately 5 feet into the native soil underlying the fill, or to refusal. Each borehole will be given a unique identification number.
- Advance a minimum of two soil borings near the southern end of the landfill to confirm the thickness of the fill in this area. Advance the borings approximately 5 feet into the native soil underlying the fill or to refusal. The locations of these borings may be adjusted in the field as necessary to avoid underground or aboveground utility lines. Additional borings may be installed to the north of the initial borings as may be deemed useful by Weyerhaeuser, in consultation with oversight agencies as needed, for purposes of designing the landfill cover (e.g., if fill material is not encountered at a location where existing data indicates fill is present).
- Prepare a Soil Boring Log (refer to Attachment B for a sample log) for each borehole based on visual observation. Classify the materials encountered based on the procedures outlined in ASTM D2488. The logs will document the borehole identification number, the drilling dates and times, names of field personnel, soil

descriptions, sample depths, and recovery. Retain a representative sample of each type of material encountered (no laboratory analyses are planned). As may be appropriate, photographs of the materials encountered or other pertinent observations will be documented. Photographs will be labeled to indicate the subject, location, date, name of photographer, and project identification number.

- The on-site geologist/engineer will prepare the Soil Boring Logs in the field. The logs will be reviewed by the senior engineer in the office. A field notebook will also be maintained by the on-site geologist/engineer to document other pertinent field information. The senior engineer will review the field notebook for clarity and completeness in meeting the investigation objectives.
- Following completion of the borehole logs, abandon the boreholes by filling them with a bentonite grout.
- Dispose of the Geoprobe® samples in an area on-site that will be covered by the final cover and in a manner that will not result in erosion before the final cover is installed.
- Decontaminate the Geoprobe® equipment following completion of the work. Decontamination will be performed at a designated location decontamination pad constructed on top of the landfill. Refer to Subsection 6.1.2 of this FSP for additional information regarding the construction of the decontamination pad.
- Decontamination of Geoprobe® equipment between borings is not necessary because new acrylic tubes will be used at each location to collect material for visual observation (samples are not being collected for laboratory analysis).
- Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).
- Survey the locations and ground surface elevations of the boreholes following completion. The accuracy of the survey will be ± 0.01 foot for the horizontal coordinates and ± 0.1 foot for the vertical elevations. The survey locations will be added to the boring logs.

A more detailed description of field procedures for soil sampling using direct push methods (i.e., Geoprobe®) is provided in SOP F-5 (Attachment A). The decontamination procedures are described above.

Landfill Gas Evaluation

Based on experience at other landfills containing similar materials, a passive gas venting system may to be necessary to prevent potential off-site migration from the landfill and to protect the integrity of the landfill cover. Thus, a detailed design for a passive gas venting system will be prepared during the design phase for the 12th Street Landfill. The design for the gas venting system may include features that support a potential future educational nature park. The passive gas venting system will also be designed such that it could be retrofitted to an active gas system if deemed necessary during the operation, monitoring, and maintenance (OM&M) period for the landfill.

To assist in the design for the passive gas venting system, the following scope of field investigations will be performed:

- As accessible, measure the concentrations of methane, carbon dioxide, and oxygen in the existing groundwater monitoring wells at the 12th Street Landfill that are screened in the vadose zone (MW-6A, MW-7A, and MW-8A), and in the Geoprobe[®] boreholes used to estimate the depth of the paper residuals along the property boundaries.
- As accessible, measure the gauge pressure in the existing groundwater monitoring wells at the 12th Street Landfill that are screened in the vadose zone (MW-6A, MW-7A, and MW-8A).

A passive gas venting system can be designed without the above information. If these data cannot be readily obtained, additional efforts will not be employed to collect this information

Field procedures for soil gas collection and sampling, and pressure measurements, are provided in SOP F-7 (Attachment A).

Extent and Depth of Residuals Outside the Landfill Footprint

Wetland Area to the North of the Landfill - The approximate areal extent of visible paper residuals beyond the toe of the landfill within the wetland has been defined through previous investigations. This delineation needs to be confirmed at limited locations as part of the predesign studies. In addition, constructibility issues associated with a high water table in the wetland and the degree of difficulty in distinguishing the visible paper residuals from the native soil also need to be evaluated. The scope of the investigative work recommended to provide this information is as follows:

- A backhoe will be used to excavate approximately 3 test pits in the wetland to the north of the landfill to confirm the approximate areal extent of visible paper residuals beyond the toe of the landfill, to evaluate potential constructibility issues associated with working in the wetland, and to assess the degree of difficulty in distinguishing the visible paper residuals from the native soil.
- The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to Attachment B for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent of the visible residuals contiguous with the landfill within the wetland. If an additional

test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a designated location-decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of this FSP for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- ~~Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill.~~ collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).
- In the event that in-field conditions limit use of excavating equipment, other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

Asphalt Plant/State Properties - The areal extent of visible paper residuals on the asphalt plant property to the southwest and on the State property to the southeast need to be delineated and the depth of visible paper residuals needs to be estimated more accurately in order to support discussions with the owners of these adjacent properties concerning access for future removal activities. The scope of the investigative work recommended to provide this information for the asphalt plant/State properties is as follows:

- A backhoe will be used to excavate approximately 3 test pits on the asphalt plant property and approximately 4 test pits on the State property.
- The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to Attachment B for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent of the visible residuals contiguous with the landfill within the wetland. If an additional test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a designated location decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of this FSP for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- ~~Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill.~~ collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).
- In the event that in-field conditions limit the use of excavating equipment, other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.
- In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

2.4.2 Sample Locations

Specific sample locations depend upon the types of samples being collected and on the field conditions. Many sample locations will be established in the field based upon site-specific conditions that impact the ability to collect representative samples and the guidelines in the work plan, QAPP and this FSP. Available information by sample type is summarized in Table 2-3. Additional details regarding the field program are included in the RD Workplan (RMT, 2008b).

Section 6

Management of Investigation-derived Waste

6.1 Purge Water and Decontamination Water

6.1.1 OU-4 and OU-5 Emergency Actions

Wastewater produced from well development and well purging and decontamination water will be temporarily stored in appropriately sized container. This water will be appropriately managed, as follows.

- All decontamination water generated during cleaning of equipment will be stored in a temporary storage tank(s) at the site.
- During operations, the water will be treated in the on-site treatment system.
- Decontamination water that is generated after the treatment system is unavailable will be characterized to identify appropriate methods of off-site treatment and/or disposal. The water samples will be analyzed for the analytes required by the treatment and/or disposal facility.

6.1.2 OU-4 Predesign Investigation

Decontamination activities performed during the predesign investigation at OU-4 will be conducted-performed at a decontamination pad constructed on top of the landfill. The decontamination pad will be roughly 15 feet wide and 25 feet long and will generally consist of a flexible membrane liner (FML) placed over an area on top of the landfill that is gently sloped and bermed so the decontamination water will flow to one location to be collected. Wood or a thin layer of soil may be placed on top of the FML so equipment can be driven on the pad without potentially puncturing the FML. The actual construction of the decontamination pad may be modified based on the selected contractor's means and methods.

Decontamination water will be collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report) discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill (this is appropriate in light of the limited amount of equipment decontamination involved in the predesign investigation).

Following completion of the predesign field activities, the decontamination pad will be dismantled and the bermed soils will be regraded to match the existing cover slope. The decontamination pad materials will be stockpiled and covered with the existing cover soils in a designated area that will not erode before the final cover is installed. These materials will be incorporated under the final landfill cover as part of the Remedial Action.

6.2 Soil

6.2.1 OU-4 and OU-5 Emergency Actions

Excess soil and samples that are produced during the drilling operations will be temporarily stockpiled at each drilling site and placed on a plastic liner. In the event of rain, and at the end of each work day, the pile will be covered with a plastic sheet. As drilling is completed at each work area, the temporary stockpile will be collected and placed into the sediment management areas at the top of the 12th Street Landfill, or into roll-off bins, barrels, 5-gallon buckets, or equivalent located in the primary staging area. After all drilling operations are completed,

samples of the accumulated soil will be collected and characterized in accordance with landfill profile requirements. After determining the proper regulatory classification, the soil will be transported for off-site disposal at the 12th Street Landfill site or another permitted disposal facility (if necessary).

6.2.2 OU-4 Predesign Investigation

After the test pits are logged, the excavated material will be placed back into the excavation and compacted sufficiently to prevent erosion from surface water runoff. Vegetation will be reestablished through natural propagation of native species.

Soil cuttings generated during the drilling of Geoprobe[®] borings will either be placed in appropriately labeled containers (e.g., 55-gallon barrels) or stockpiled and covered with a low-permeability material in a designated area that will not erode before the final cover is installed. These materials will be incorporated under the final landfill cover as part of the Remedial Action.

6.3 Used Personal Protective Equipment and Noncontaminated Refuse

Used personal protective equipment and other types of general noncontaminated debris or waste materials produced during the fieldwork will be collected daily in sealed plastic bags, and placed in a waste dumpster that will be brought to the site for the project. The wastes will be disposed by a local commercial waste disposal contractor at the end of the fieldwork.

**Revisions to the Health and Safety Plan
(Appendix C of the Remedial Design Workplan
for the 12th Street Landfill Operable Unit)**

- Section 3 – Predesign Studies (pages 7 through 10)
- Section 5 – Site Health and Safety Plan Decontamination Procedures (page 47)

Section 3

Predesign Studies

Predesign studies are proposed to assist in the development of the remedial design for OU-4. The proposed predesign studies, along with the objectives and scope of the studies, are summarized in the subsections that follow. Additional details regarding the methods, procedures, equipment, and materials are contained in the Multi-Area Quality Assurance Project Plan (QAPP) (Appendix A in the RD Workplan) and the Multi-Area Field Sampling Plan (FSP) (Appendix B in the RD Workplan).

Decontamination of equipment utilized during the predesign studies will be performed at a designated location-decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill (this is appropriate in light of the limited amount of equipment decontamination involved in the predesign investigation). collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be temporarily transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

3.1 Data for Grading Design

Additional data are needed to better estimate the thickness of paper residuals along the property boundaries with 12th Street, the asphalt plant to the southwest, and with the State property to the southeast, in order to reduce uncertainties in designing the final cover grades and to support discussions with the owners of these adjacent properties concerning access for purposes of implementing the remedial action. The scope of the investigative work necessary to obtain these data is as follows:

- Advance approximately 9 Geoprobe® borings into the 12th Street Landfill at select locations where fill material is believed to extend beyond the property landfill boundary to the southwest and to the southeast (Geoprobe® borings RDB-01 through RDB-09 on Figure 9 in the RD Workplan). The borings will be advanced approximately 5 feet into the native soil underlying the fill, or to refusal.
- Advance a minimum of two soil borings (RDB-10 and RDB-11) near the southern end of the landfill, as shown on Figure 9 in the RD Workplan, to confirm the thickness of the fill in this area. Advance the borings approximately 5 feet into the native soil underlying the fill or to refusal. The locations of these borings may be adjusted in the field as necessary to avoid underground or aboveground utility lines. Additional borings may be installed to the north of the initial borings as may be deemed useful by Weyerhaeuser, in consultation with the oversight agencies as needed, for purposes of designing the landfill cover (e.g., if fill material is not encountered at the location where existing data indicates fill is present).
- Prepare a Soil Boring Log (refer to the FSP in Appendix B in the RD Workplan for a sample log) for each borehole based on visible observation. Classify the materials encountered based on the procedures outlined in ASTM D-2488. The logs will document the borehole identification number, the drilling dates and times, the names of field personnel, soil descriptions, sample depths, and recovery. Retain a representative sample of each type of material encountered (no laboratory analyses are planned). As may be appropriate, photographs of the materials encountered or other pertinent observations will be documented. Photographs will be labeled to indicate the subject, location, date, name of photographer, and project identification number.

- The on-site geologist/engineer will prepare the Soil Boring Logs in the field. The logs will be reviewed by the senior engineer in the office. A field notebook will also be maintained by the on-site scientist to document other pertinent field information. The senior engineer will review the field notebook for clarity and completeness in meeting the investigation objectives.
- Abandon the boreholes by filling them with bentonite grout following completion of the borehole logs.
- Decontaminate the Geoprobe® equipment following completion of the work. Decontamination will be performed at a designated location decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of Geoprobe® equipment between borings is not necessary because new acrylic tubes will be used at each location to collect material for visual observation (samples are not being collected for laboratory analysis).
- Dispose of the Geoprobe® samples on-site in an area that will be covered by the final cover and in a manner that will not result in erosion before the final cover is installed.
- Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running of the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).
- Survey the locations and ground surface elevations of the boreholes following completion. The accuracy of the survey will be ± 0.01 foot for the horizontal coordinates and ± 0.1 foot for the vertical elevations. The survey locations will be added to the boring logs.

3.2 Landfill Gas Evaluation

Based on experience with other landfills containing similar materials, a passive gas venting system is likely to be necessary to prevent potential off-site gas migration from the landfill and to protect the integrity of the landfill cover. The detailed design of the passive gas venting system will be prepared during the design phase for the 12th Street Landfill and may include features that support the potential future development of an “eco-park.” The passive gas venting system will also be designed such that it could be retrofitted to an active gas system if deemed necessary during the operations, monitoring, and maintenance (OM&M) period for the landfill.

To assist in the design for the passive gas venting system, the following scope of work will be performed:

- Review information that may be provided by the MDEQ in connection with the management of subsurface landfill gas at the King Highway Landfill (Operable Unit #3) for potential applicability to the 12th Street Landfill.
- Measure the concentrations of methane, carbon dioxide, and oxygen in the existing groundwater monitoring wells at the 12th Street Landfill that are screened in the vadose zone (MW-6A, MW-7A, and MW-8A), and in the Geoprobe® boreholes used to estimate the depth of the paper residuals along the property boundaries (refer to Figure 9 in the RD Workplan). Pressures that may have developed within the groundwater monitoring wells caused by excess landfill gas (if present) will also be measured.

A passive gas venting system can be designed without the above information. If these data cannot be readily obtained, additional efforts will not be employed to collect the information.

3.3 Extent and Depth of Residuals Outside the Landfill Footprint

Wetland area to the north of the landfill - The approximate areal extent of visible paper residuals beyond the toe of the landfill within the wetland has been defined through previous investigations (G&M, 1994b and U.S. EPA, 2004). This delineation needs to be confirmed at limited locations, as part of the predesign studies. In addition, constructibility issues associated with a high water table in the wetland and the degree of difficulty in distinguishing the visible paper residuals from the native soil also need to be evaluated. The scope of the investigative work recommended to provide this information is as follows:

- Approximately three test pits (RDTP-01 through RDTP-03) will be excavated at the approximate locations in the wetland as shown on Figure 10 in the RD Workplan. The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to the FSP in the RD Workplan for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent of the visible residuals contiguous with the landfill within the wetland. If an additional test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.
- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a designated location-decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

In the event that in-field conditions limit the use of test pit excavating equipment (e.g., backhoe), other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

Asphalt Plant/State properties - Delineation of the areal extent and depth of visible paper residuals on the asphalt plant property to the southwest and on the State property to the southeast is needed in order to support discussions with the owners of these adjacent properties concerning access for future remedial

actions. The scope of the investigative work recommended to provide this information for the asphalt plant/State properties is as follows:

- Approximately three test pits (RDTP-08 through RDTP-10) will be excavated on the asphalt plant property, and approximately 4 test pits (RDTP-04 through RDTP-07) will be excavated on the State property, at the approximate locations shown on Figure 10 in the RD Workplan.
- The test pits are anticipated to be approximately 10 to 15 feet long (perpendicular to the edge of the landfill) and approximately 2 to 4 feet wide. The test pits will be excavated to a maximum depth of 3 feet if no paper residuals are apparent, or to the bottom of visually-identifiable residuals. The depth and lateral extent of residuals in each test pit will be documented in the field by preparing a Test Pit Log (refer to the FSP in the RD Workplan for a sample log).
- If visible residuals are observed in the end of a test pit furthest from the landfill, the test pit may be extended further away from the landfill and/or an additional test pit (or more) may be excavated nearby in order to confirm the areal extent and depth of visible residuals on the asphalt facility and/or the State property in order to support discussions with the owners of these properties concerning access for future remedial actions. If an additional test pit (or more) is needed, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.
- Equipment used to excavate the test pits will be decontaminated following completion of the work. Decontamination will be performed at a ~~designated location~~ decontamination pad constructed on the top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination of equipment between test pits is not necessary because samples are not being collected for laboratory analysis. Clumps and loose material will be removed from the bucket of the excavating equipment using hand tools as needed to obtain good visual characterization of the material present in the test pits. The clumps and loose material will be placed in the test pits.
- Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

In the event that in-field conditions limit the use of test pit excavating equipment, other tools, such as hand augers or shovels, may be used instead. In such instances, the U.S. EPA project manager, or designated alternate, will be contacted to discuss the situation and to agree on a course of action.

In addition, Weyerhaeuser will conduct a kick-off meeting with the U.S. EPA and its field representative(s) at the outset of the predesign field investigation. During this meeting, the schedule for conducting the predesign field activities and the process for obtaining U.S. EPA approval of field modifications will be reviewed.

3.4 Leachate Collection System Evaluation

The potential need for either an interim or a long-term leachate collection system within the fill materials as part of the remedial design will be evaluated during the predesign studies for the 12th Street Landfill. The evaluation will consider the presence of perched liquid within the waste; the water content of the waste; the potential for and the effects of settlement following placement of the final cover; the amount of water expected to be generated after placement of the final cover; and the practicability of extracting water from the fill materials.

Site Health & Safety Plan

(Required for all RMT Type 2 or Type 3 field projects.)

Decontamination Procedures:

Personnel:

Site workers should plan and stage for wash water and soap at the site, prior to beginning the work. Site workers should wash hands and any exposed skin extremely well with soap and water, prior to leaving the contamination reduction zone, eating, drinking, driving, or leaving the site. Any soiled or contaminated clothing should be removed and handled appropriately, by either washing as soon as possible, or if necessary, disposing. Soiled or contaminated clothing should be carefully bagged prior to disposal or washing, to reduce potential exposure.

Equipment:

The equipment which are known or suspected to be contaminated with paper residuals or sediment will be decontaminated. Decontamination will be performed at a decontamination pad constructed on top of the landfill. Refer to Subsection 6.1.2 of the FSP (Appendix B) for additional information regarding the construction of the decontamination pad. Decontamination will require the use of water, steam, heated detergent solutions, or water-miscible solvents, whichever is most effective. Decontamination water will be discharged to the landfill surface at a rate that allows infiltration into the landfill without running off of the landfill, collected and containerized in 55-gallon barrels that will be properly labeled and temporarily stored on-site. A sample of the decontamination water will be collected and tested for the parameters required by a permitted off-site disposal facility. Following receipt of the analytical results, the decontamination water will be transported and disposed at the off-site facility. Documentation of off-site disposal activities will be included in the technical memorandum documenting the findings and conclusions of the Predesign Studies (to be submitted as part of the Design Report).

Disposal of Investigation-derived Material:

- ☒ Leave on site for disposal. ☐ Other:

Work Limitations (time of day, buddy system, etc.):

- ☐ Buddy system required for some tasks
☒ Work will be performed during daylight hours only
☐ Work will be performed using artificial light.

Describe or attach a lighting plan:

- ☒ No eating, drinking, or smoking in contamination reduction zone(s) or exclusion zone(s)
☒ When temperatures are either above 80°F or below 20°F, work schedules may be modified
☐ Other site-specific limitations: